

REMARKS

This Amendment is in response to the Advisory Action dated August 12, 2004 and the previous final rejection dated June 2, 2004. Applicant would like to thank the Examiner for indicated allowability of dependent claim 7. Applicant respectfully requests reconsideration and allowance of claims 1-10 and requests consideration and allowance of new claim 11 in view of the following remarks.

I. REJECTION OF CLAIMS 1-2, 8 AND 10 BASED ON TURNER ET AL.

Claims 1-2, 8 and 10 were rejected as being anticipated by Turner et al., U.S. Patent No. 4,338,097.

A. **Turner Et Al. Do Not Disclose A Closed Ring**

A "complete ring" in the context of the Turner et al. patent is not a "closed ring" within the context of claim 1 of the present application. Rather, a "complete ring" as disclosed in Turner et al. is a helix that extends around the full (i.e., "complete") inner diameter of a pipe and has unconnected, overlapping ends.

In the Advisory Action, the Examiner suggested that Turner et al. disclose a test element in the form of a closed ring in column 2, lines 2, 30-34. However, this section states:

"The thickness of the test element may be monitored by any suitable method, e.g., by ultrasonics, vibrational frequency measurement and induction impedance measurement in which case an element in the form of a complete ring may be employed."

(Emphasis added)

The cited section must be read in the context of the surrounding discussion. These sections are taken from the summary of the invention section where the test element is first listed as "an elongated strip test element" (column 2, line 4)

and then an "elongated strip test element . . . extending over substantially all of one dimension of said complement surface" (column 2, lines 19-24).

The initial paragraphs of the summary therefore do not require the elongated strip test element to form a complete ring. The discussion in column 2, lines 30-34 simply narrows the description such that the elongated strip test element forms a complete ring as it extends over the full dimension of the complement. It does not suggest that the element forms a closed ring. In fact, this would be inconsistent with the previous language.

Turner et al. also state in column 1, lines 60-62 that, "the test element extends round all, or nearly all, the pipe interior cross-section . . . ." In the same sentence, Turner et al. refer to "the length" of the test element. The length of a closed ring is clearly a meaningless quantity such that Turner is clearly not disclosing or suggesting a closed ring for resistance measurement. Note also the words "elongated strip test element," in the above-cited passages of the summary section, which very clearly cannot be describing a closed ring.

Further, the detailed description and the associated figures in Turner et al. disclose an open ring in the form of a helix, as opposed to a closed ring. Col. 4, lines 4-6 state, "If desired, the groove 5 may be made as a helix, with overlapping ends, as shown in FIG. 4, to ensure monitoring of the complete pipe cross-section." (Emphasis added). FIG. 4 clearly shows that "a complete ring" means that the test element circumscribes the interior diameter of the pipe with overlapping ends.

In the context of the Turner et al. patent, "a complete ring" is therefore not the same as "a closed ring" recited in claim 1 in the present application. In fact, Turner et al. teach away from joining the two ends since it suggests placing a

connection point at each end in order to measure the resistance along the whole length of the test element (see FIG. 3).

**B. Turner et al. Do Not Disclose A Resistance Monitor In Combination With A Closed Ring Sensor Element.**

The Office Action mistakenly concludes that because the real component of an impedance is a resistance, the Turner et al. patent discloses a closed ring test element in combination with a resistance monitor. Turner et al. specifically mention an induction impedance measurement in column 2, lines 32-34. The inductance and capacitance are clearly imaginary parts of an impedance, whereas the resistance is the purely real part of an impedance. Therefore, measurement of inductive impedance (i.e., the inductance) is not the same as measurement of resistance.

Since Turner et al. do not disclose each and every element of independent claim 1, Applicant respectfully requests that the rejection of claim 1 and its dependent claims 2, 8 and 10 under §102(b) be withdrawn.

**II. REJECTION OF CLAIMS 3-6 UNDER §103(a)**

Claims 3-6 were rejected under §103(a) as being unpatentable over Turner et al. in view of Marsh et al., U.S. Patent No. 2,987,672.

The Office Action acknowledges that Turner et al. do not specifically disclose that the electrical connections are diametrically opposed to each other. The Office Action relies on the Marsh patent for diametrically opposed electrical connections. However, even if the references were combined as suggested in the Office Action, the resulting combination would still lack a resistance monitor in combination with a closed ring sensor element as recited in independent claim 1.

The Office Action therefore fails to present a prima facie case of obviousness with respect to claims 3-6. Applicant respectfully requests that the rejection of claims 3-6 under §103(a) therefore be withdrawn.

III. REJECTION OF CLAIM 9 UNDER §103(a)

Claim 9 was rejected under §103(a) as being unpatentable over Turner et al. in view of Rhoades et al., U.S. Patent No. 4,587,479.

Again, the Office Action acknowledges that Turner fails to disclose a spacer ring comprising a pressure sensor, but relies on Rhoades for disclosing a pressure sensor adjacent a probe element.

Again, even if the references were combined as suggested in the Office Action, the resulting combination would still fail to teach or suggest a resistance monitor in combination with a closed ring sensor element. Applicant therefore respectfully requests that the rejection of claim 9 under §103(a) therefore be withdrawn.

IV. NEW CLAIM 11

New claim 11 is added for consideration. New claim 11 is identical to existing claim 1, but further requires the resistance monitor to selectively monitor changes in electrical resistance in a plurality of sectors of the ring sensor element.


One advantage of measuring the resistance of a closed ring is that by placing connection points on the ring, the resistance can be measured in different sectors. One embodiment of the present invention uses six sectors (see FIGs. 2 and 3 of the present application) and monitors the resistance in each of these in turn (pages 11-13). While it might be possible to split the non-closed test element in Turner et al. into individual lengths, this arrangement is not favored since Turner et al. state (column 1, lines 61-64) that a longer test element is desirable since it will have a longer life without sacrificing sensitivity. The invention recited in new claim 11 therefore moves away from the teaching of Turner et al. and provides more flexibility in how the resistance measurement may be carried out.

Consideration and allowance of new claim 11 is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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